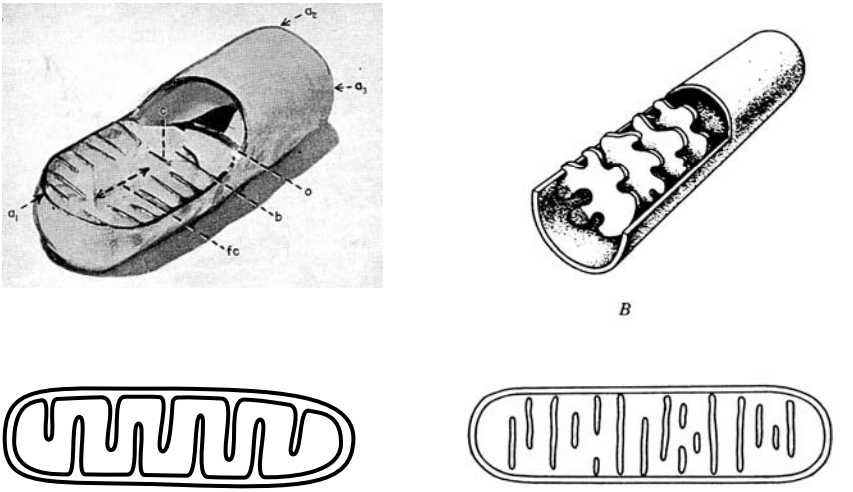

Figure 6.3. Contrasting interpretations of the internal structure of the mitochondrion as 3D models (top) and as 2D medial longitudinal sections (bottom). Palade's 3D model (left) is reproduced with permission from G. E. Palade (1953), An electron microscope study of mitochondrial structure, *Journal of Histochemistry and Cytochemistry, 1*, 188–211, p. 197. The 2D diagram is drawn by the author. Sjöstrand's 3D and 2D diagrams (right) are reproduced from F. S. Sjöstrand (1956), Electron microscopy of cells and tissues, in *Physical techniques in biological research*, G. Oster and A. W. Pollister, Eds. New York: Academic Press, pp. 241–98.

individual structures with only topographic relations to the outer membrane. Therefore the term, *cristae mitochondria*, is misleading" (p. 413).

The following April, at a symposium on the structure and chemistry of mitochondria at the Histochemical Society meetings in Chicago, Palade (1953) accepted Sjöstrand's claim that the mitochondrion was bounded by a double membrane,[16] and proposed that it was only the inner membrane which folded into the interior to form cristae. Sjöstrand remained opposed to the idea of infolding, arguing that the double-layered membranes traversing the mitochondrion were not attached to the (also double-layered) outer membrane. He also claimed that these double-layered traversing membranes went fully across the mitochondrion, whereas Palade proposed that there was an open channel extending through the interior of the mitochondrion, which he

[16] Sjöstrand himself referred not to two membranes but to a single double-layered membrane which he interpreted in terms of Danielli and Davson's sandwich model (see Figure 3.4). He held that the outer layers of proteins accounted for the two dark bands while the inner phospholipid layer accounted for the lighter area between them. Palade, not trying to provide a physical interpretation of membrane structure, simply interpreted each dark band as a separate membrane.